CE

Ground Penetrating Analyzer

GPA 1000

User's Manual KTS – 3 D

KTS-Electronic

Germany

Table of content

1 General guidelines 4
1.1 Preface 4
1.2 Important details 4
1.3 Scope of delivery 4

2 Hardware operation 6
2.1 Assembly 6
2.2 Front 7
2.3 Starting the electronic 8

3 Program start 9
3.1 Software-reinstalling (with reinstalling of Windows) 9
3.2 Bluetooth pairing 9

4 The search process 11
4.1 Search with the universal probe 11
4.2 Search with the super probe 11
4.3 Live mode 12
4.4 3D-search mode 12
4.4.1 Preadjustment 13
4.4.2 Start-button 13
4.4.3 End of measurement 13
4.4.4 Transfer of measurement data 14
4.4.5 3-D figures 14
4.5 Search process (measurements) 14
4.5.1 Searches with rectification 15
4.5.2 Searches in counter direction 16

5 Program operations 17
5.1 Main window 17
5.1.1 Toolbar 17
5.1.2 Display range 18
5.2 Menu bar 18
5.2.1 Data menu 18
5.2.2 Display menu 18
5.2.3 Options menu 18
5.2.4 Info menu 18
5.3 Options window 19
5.3.1 Paths 19
5.3.2 Colors and coordinates 19
5.3.3 Languages 20

6 Data recordings 20
6.1 Adjustment before data recording 20
6.1.1 Display during data recording 21
6.1.2 Display after completion of data recording 21
6.2 Display alternatives 22

6.2.1 Figures proportional or quadratic 22
6.2.2 Figures data absolutely or relatively 22
6.3 Accumulator and charger 22

7 System requirements and license agreements 23
7.1 System requirements 23
7.2 License agreements 23
7.3 Utilization regulations 23
7.4 Liability exclusions 23

8 Warranty 24
8.1 After expiry of warranty 24
8.2 Legal notice 24

9 Contact 25

1 General guidelines

1.1 Preface

We congratulate you on your purpose of one of the most advanced geophysical ground control utensil – GPA.

The assembly is very simple since the programs are already pre-installed and the instruction manual is written in plain style with the help of numerous illustrations.

This instruction has been developed by the KTS-Electronic company. Any alterations or duplications are only allowed with the written permission of KTS-Electronic. KTS-Electronic reserves the right to modify the instruction with new knowledge at anytime. The new instructions can always be downloaded gratuitously from our website.

1.2 Important details

Please note:

- Do not store appliance in wetness or high moistures.
- Avoid current-carrying overhead lines
- Do not use mobile phones during the operation
- Do not process any measurement during thunderstorms
- Accurate operation is not guaranteed with empty accumulator
- For the operation or loading please only use the components enclosed or released by KTS.

1.3 Scope of delivery

Hardware:

- GPA 1000 electronic unit with installed lithium ion accumulator, shoulder strap
- 45 cm (17.72") universal probe
- 60 cm (23.62") super probe
- 2 part carbon telescope pole with carrier bag
- Ultramobile Netbook PC 10,1" with preinstalled software incl. bag and lithium-ion accumulator
- Rapid battery recharger
- Solid bag

Software:

- Newly developed KTS-3D software with 5 basic colors (pre-installed on PC)
- USB stick with software for processing data on other computers

GOLD SCAN accessory metal discrimination detector:

- GOLD SCAN electronic unit with installed lithium ion accumulator, leather bag with carrying strap
- Powerful quick-charger (2800 MA) with power inverter, car-loading cable and 110 volts adapter
- 45 cm (17.72") search coil with telescopic pole

Service:

- English, German French and Spanish user's manual
- 2 year manufacturer's warranty for the entire scope of delivery (including hardware and software)

2 Hardware operation

2.1 Assembly

Contrary to other appliances the assembly is very simple.

The mounting of universal and super probe:
Insert the remaining parts in the correct order. The universal or super probe can be attached to the holder now. Afterwards the sensor cable must be connected. Your device is ready to operate!

Fig.: 4-part demountable universal probe

Fig.: Telescope bar

Fig.: Telescope bar - disassembled

2.2 Front

Turn-switch:
The turn-switch has 4 positions:

- OFF The device is switched off.
- BAT The display shows the current battery voltage (should lie between 7 and max. 8.2 Volt).
- SENSOR The sensor values are readable on the display.
- ECO Power save mode, display lighting off.

Toggle-switch: SENSOR/CALIBRATION

- SENSOR Shows the battery voltage (BAT) or the current value sensor (SENSOR or ECO).
- CALIBRATION Shows always calibration value.
- Bluetooth-connection is ready if green LED flashes and bound if LED lights up constantly

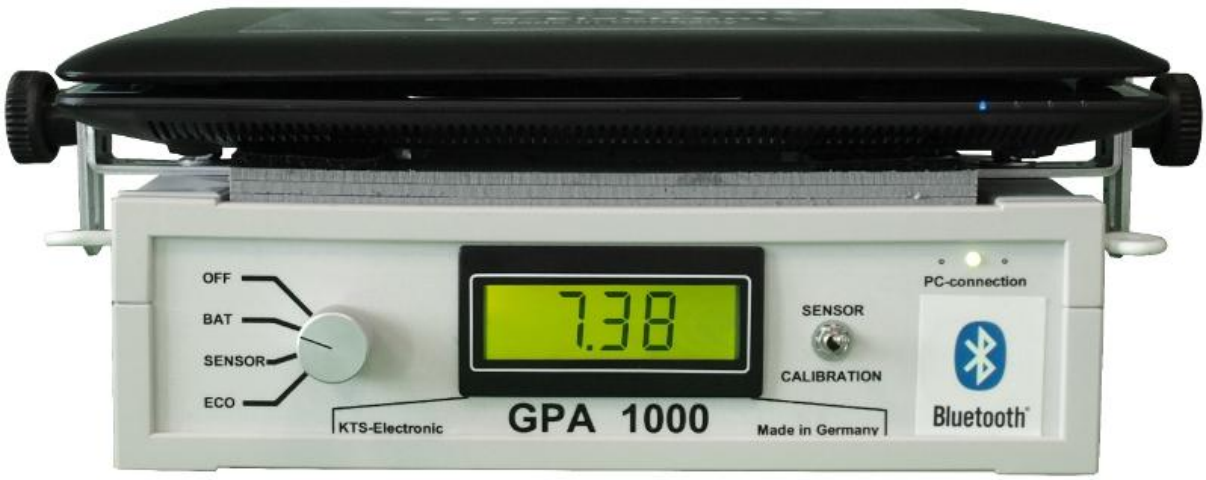


Fig.: front of electronic unit (GPA 1000)

2.3 Starting the electronic

To control the current charge of battery switch on the electronic part with the turning knob to BAT. This value must always lie over 7.5 Volt (otherwise please charge the battery). Then turn to the position SENSOR or ECO to read the sensor or calibration data on the screen. The sensor data should always lie between 1-4, the calibration approx. 2.5 (before the calibration automatically is set it could temporarily show other values).

Through Bluetooth-connection the transfer of measured data to the PC is saver, quicker and easier – contrary to other devices, which comprehend such data via ordinary cable connection.

Fig.: Complete electronics unit with PC

3 Program start

After booting the PC and double-click on the KTS-3D icon start the KTS software. GPA 1000 will be automatically connected to the computer (be sure that GPA 1000 is turned on ***before*** you start KTS 3D-Software). Should this not be the case, please see 3.2.

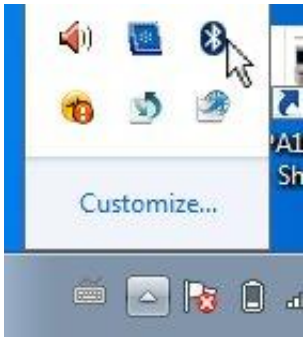
3.1 Software-reinstalling (with reinstalling of Windows)

In case you want to connect another laptop (with Bluetooth-connection) to the main unit or if you have to reinstal Windows please copy the entire data content from the provided USB stick to the hard disc. Additional software is not necessary. Therefore your tool is operational and ready for use.

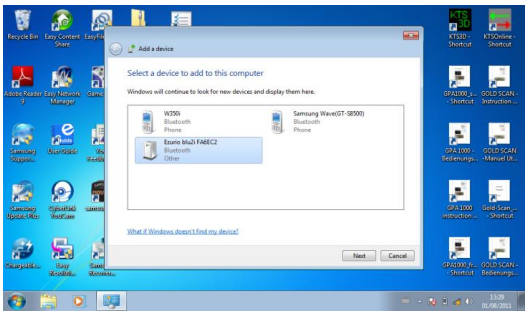
3.2 Bluetooth pairing

This menu item is completely preinstalled and only has relevance, if software not connects automatically with the GPA 1000 unit or you want to link GPA 1000 with another computer with Bluetooth-ability. Start the computer and make sure that Bluetooth is engaged. If this is not the case, activate Bluetooth by pressing

The Bluetooth symbol will appear in the menu bar. Via right-click on the above symbol the **add a device**–window will show all available Bluetooth devices (it is necessary that GPA 1000 is active and the green LED flashes).



Select **Ezurio Blu 2I** and click “Next”. In the next window pick “Enter the device’s pairing code”, insert the password **“1234”** and go to “Next” (the device will automatically instal the suitable drivers). Finally click the Close-button to conclude the procedure.



Add a device
Select a pairing option
Create a pairing code for me
The device has a keypad.
Enter the device's pairing code
The device comes with a pairing code.
Check for one on the device or in the device manual.
Pair without using a code
This type of device, such as a mouse, does not require a secure connection.
How can I tell if my device has a pairing code?
Ezurio blu2i FA6EC2
Next
Cancel

Add a device
Enter the pairing code for the device
This will verify that you are connecting to the correct device.
1234
The code is either displayed on your device or in the information that came with the device.
Ezurio blu2i FA6EC2
What if I can't find the device pairing code?
Next
Cancel

Click “Start” →“Computer” → “System Properties” → “Device Manager” → double-click on “Ports (COM & LPT)”. Two subitems (Standard Serial over Bluetooth link) will appear – you should memorize the lower COMPORT number. After that open KTS 3D-Software, click on “Options” → “Serial Interface” and choose the memorized COMPORT and click “OK”. Restart the Software and the device will automactically connect to the computer. You will recognize this if the LED lights up permanently. GPA 1000 is now operational.

For further usage you only should notice that Bluetooth is active and the GPA 1000 device is turned on (above proceedings must not be repeated).

4 The search process

During soil analysis one can choose between several search modes.

4.1 Search with the universal probe

- Turn the probe in that manner that the arrow (see side part of probe) shows to the ground during inspection (so you can reach the highest search performance).
- After engaging the electronic and check-up of battery condition turn the turn-switch to sensor position.
- Check the calibration over the toggle-switch before searching (approx. 2.5).
- Now use this toggle-switch when turning back to sensor position. Assure yourself that the indicated value lies between 1-4. Should this not be the case, change the search direction slightly so that the value stands between 1-4.

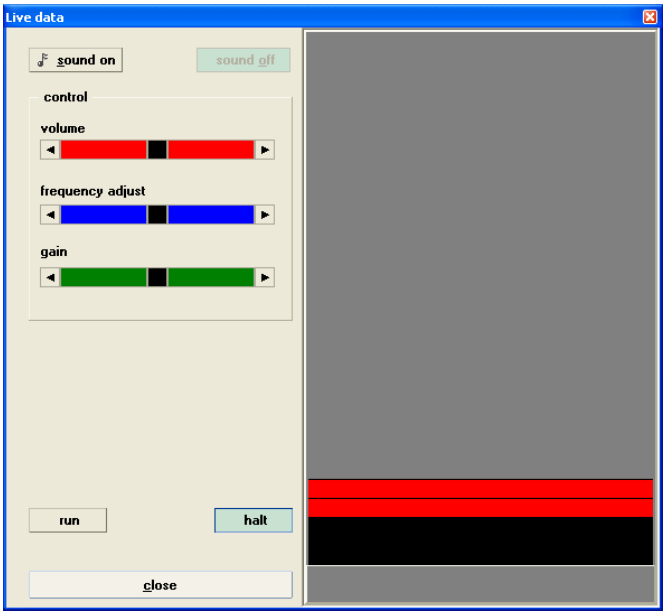
The further search procedure is decribed under 4.3.

4.2 Search with the super probe

The super probe is similar to the universal probe, but has approx. 30% more depth performance. Search with the super probe is complex because the magnetic direction of the probe needs to be adjusted. Beforehand it is absolutely necessary to choose the search direction in such a way that values between 1-4 are displayed.

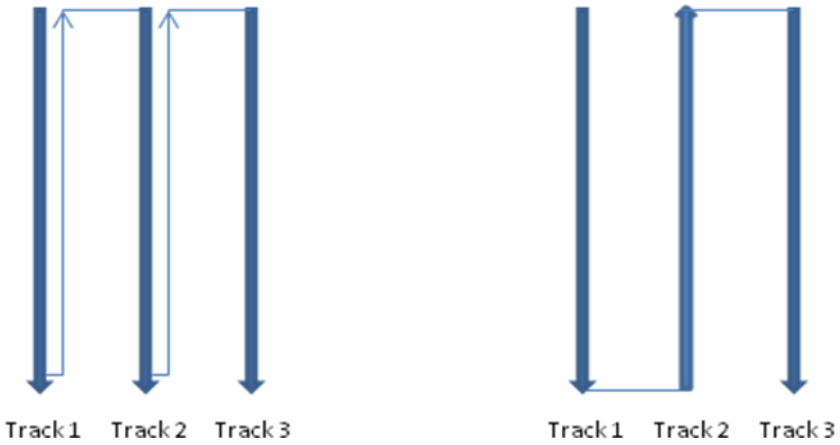
4.3 Live mode

To mark relevant sectors it is reasonable to scan large areas in the live mode at first so that afterwards the control in the 3-D-system is more exact. If the live mode stops unexpected, press the “start” button again and continue with the search.



4.4 3D-search mode

For the exact examination of the ground, the area should be divided into tracks. These tracks can be scanned in the same direction or in counter-direction. The running direction is selectable in the settings window.

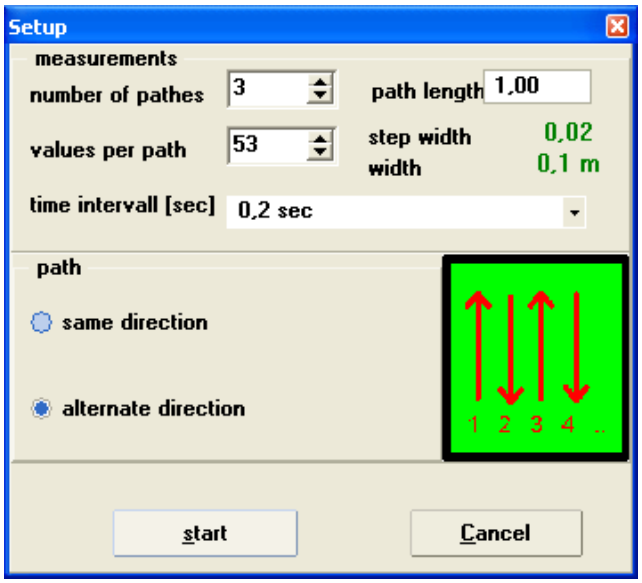


The track length can be selected variably (during the search after large objects or excavations longer track lengths can be chosen). For the search after small items shorter track lengths are recommended.

4.4.1 Preadjustment

With the "new" button on the screen the search begins,

the computer requires the sensor number, track length, track number, track and measurement speed, etc.

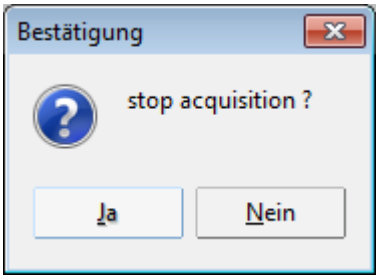


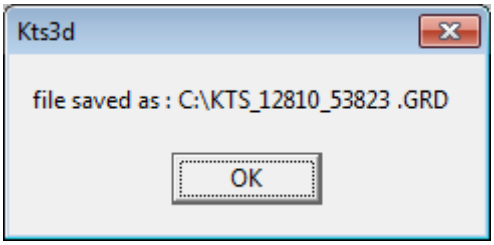
4.4.2 Start-button

By pressing the start button the search begins. The results are shown on the screen 2-dimensionally, while the measurements are completed automatically. The start button must be pressed again at the next track.

4.4.3 End of measurement

After the last track has ended, you are going to be questioned if you want to store the measurements. With the O.K. button the measurement is stored internally on a place intended for it.



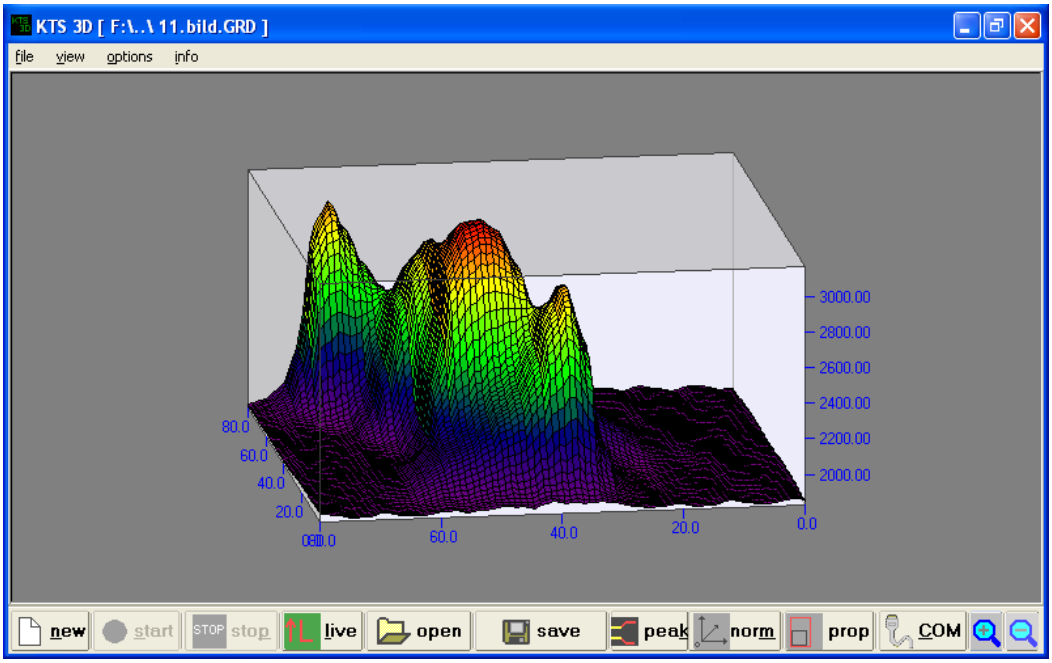


4.4.4 Transfer of measurement data

The provided USB-stick can also be used for the transfer of measuring data; you can transmit to other PCs and call up all informations for further processings.

4.4.5 3-D figures

The measurement data can be shown as 3-D figures.



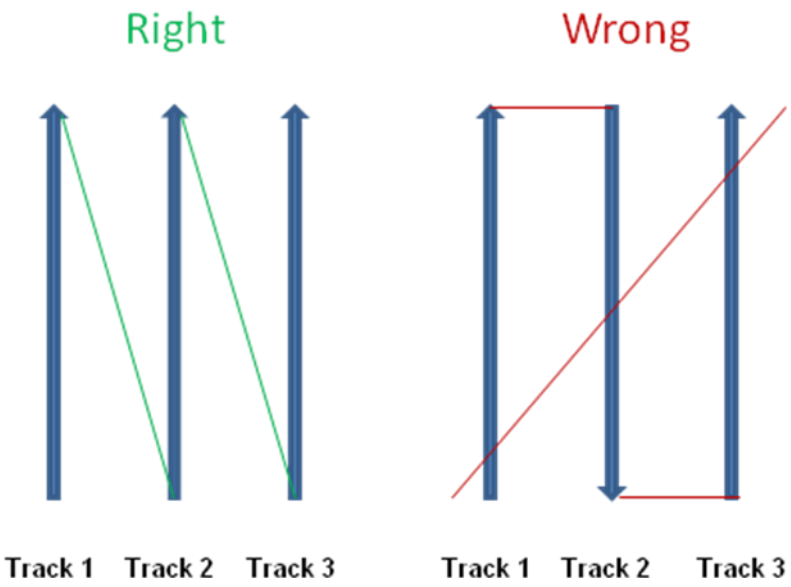
The right side shows every modification and its dimension.

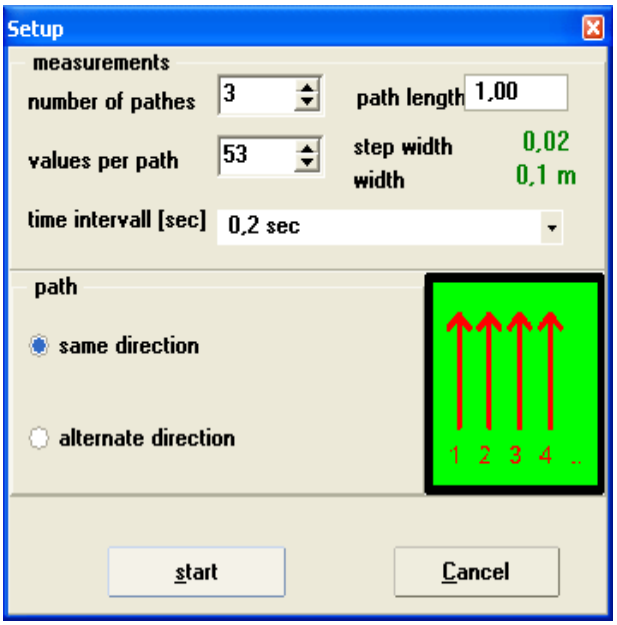
4.5 Search process (measurements)

The GPA is a gauge, which can measure alterations of ground anomalies caused by metal objects, soil structure or excavations; it also is able to discriminate from normal ground magnetism. Correct results strongly depend on ground type and measuring method. Areas to be measured should not have electric fields (like high voltage cables or ground wires), strong mineralising or wet grounds because they influence the measuring. The dryer the soil, the more precise are the results.

You should divide the area to be measured into even tracks. You may choose between 2 methods:

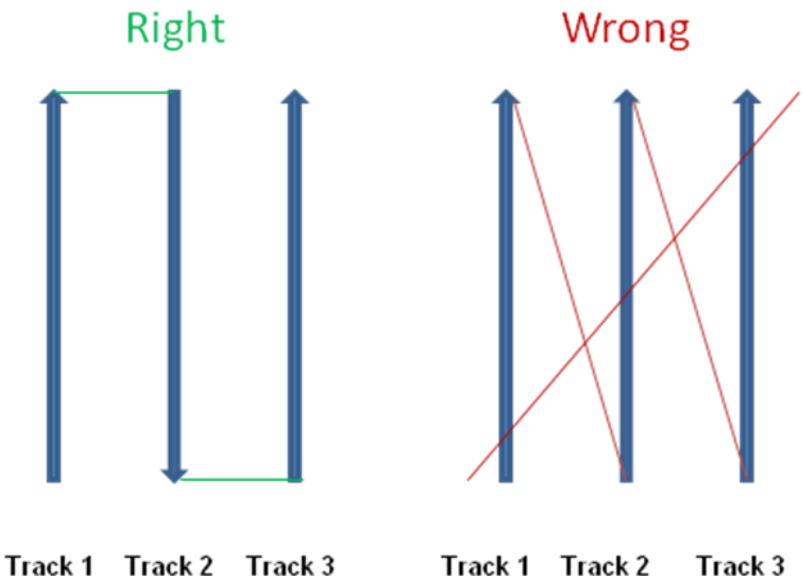
4.5.1 Searches with rectification





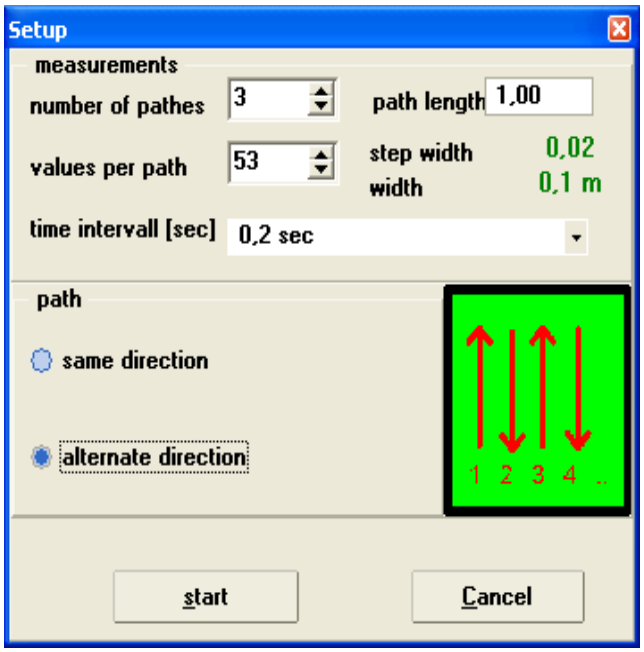
If you have chosen the search in rectification, you should come back to the starting point after completion of each track and press the start button (for the measurements of the second track).

4.5.2 Searches in counter direction



If you have chosen the search in counter direction, you should turn around after completion of each track, step approx. 1 Meter to the right and directly start the next track by pressing the start button.

For a precise measurement you should hold the search speed in a stable manner while you are walking the tracks. This way objects can be detected at the same spot during counter direction. For exact measurements track lengths between 5 to 10 Meters are advantageous.

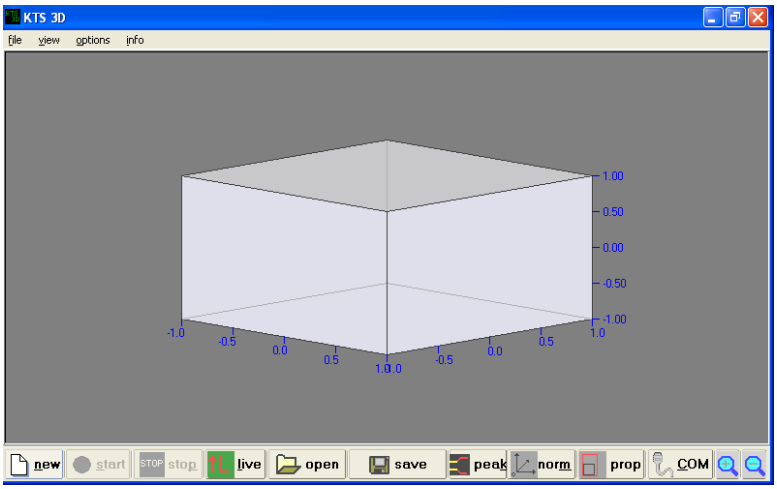


5 Program operations

The program serves the visualisation of measurement data in colored, three dimensional representation, in particular the ad of magnet field data.

5.1 Main window

After start of program the main window appears with the menu bar, the tool bar the adjustment and the ad-area (right),



When the program starts the display range is empty at first.

5.1.1 Toolbar

Some buttons are summarized for fast operation. These are from left to right:

- ☐ New shows a data reception with external hardware
- ☐ Start starts a data reception with a track
- ☐ Stop stops the data reception
- ☐ Live starts a data reception in live mode
- ☐ Open reads a stored file
- ☐ Save saves the current file
- ☐ Peak switches between absolute and relative ad
- ☐ Norm resets main-ad into basic setting
- ☐ Prop switches between proportional and quadratic representation
- ☐ Zoom the two buttons [+] and [-] steer the enlargement

5.1.2 Display range

The colored, three-dimensional measured data will appear on the display range. While moving the mouse with pressed left mouse button the presentation can be rotated at the same time.

5.2 Menu bar

5.2.1 Data menu

The data menu shows entries to enable the opening and storing of measurement data. The stored measurement data is marked through the ending GRD.

- ***New*** starts a data acquisition with connected external measurement hardware. A selection window appears for the adjustment of the measurement conditions.
- ***Copy into clipboard*** copies the current view in the cache so that it can be inserted into every image editing application.
- ***End*** ends program.

5.2.2 Display menu

In this menu you can switch between graphic and numeric views of measurements.

5.2.3 Options menu

The options menu entry opens a new window for the adjustment of program options. The description of the various possibilities takes place there.

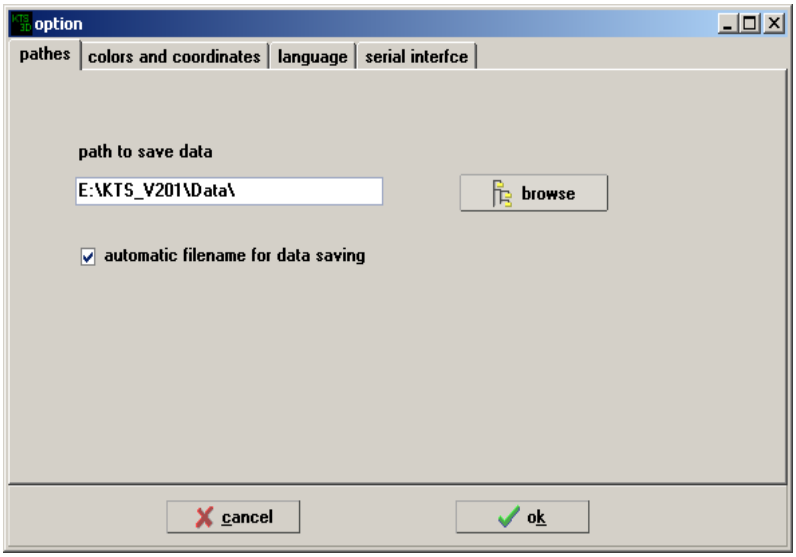
5.2.4 Info menu

Only one single point appears in the info menu. It delivers information about the present version.

5.3 Options window

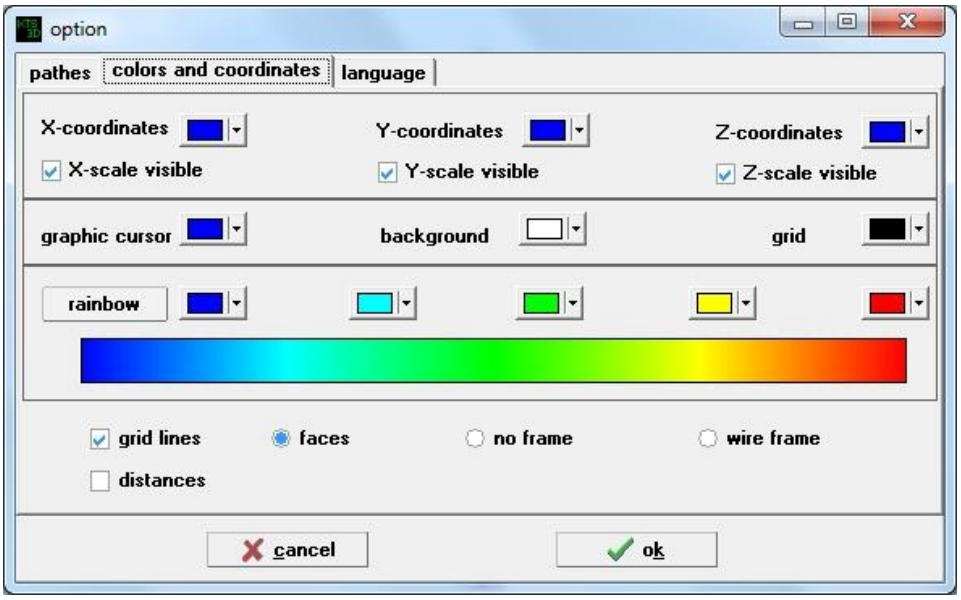
The options window is divided into three categories.

5.3.1 Paths



With the path adjustment the index is defined for the data storage. A selection dialogue appears after the [search] button is activated.

5.3.2 Colors and coordinates



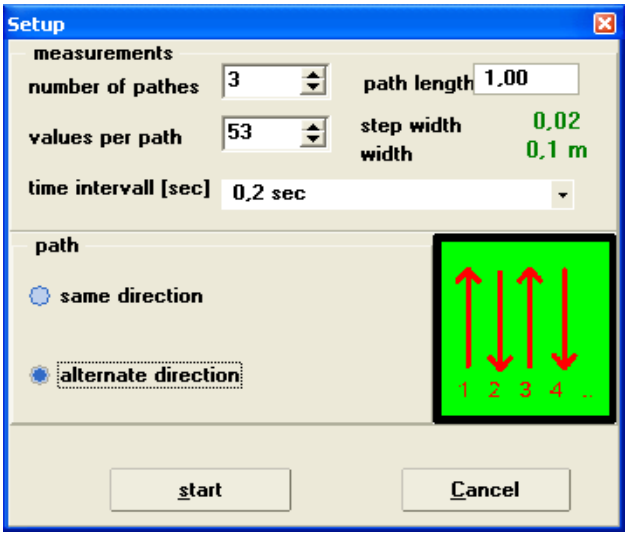
Here you can choose colors for the coordinate-ad, graphic cursor and the background. A color-selection dialogue appears after activity of the corresponding buttons.

5.3.3 Languages

For the service in several languages the program can be switched completely.

6 Data recordings

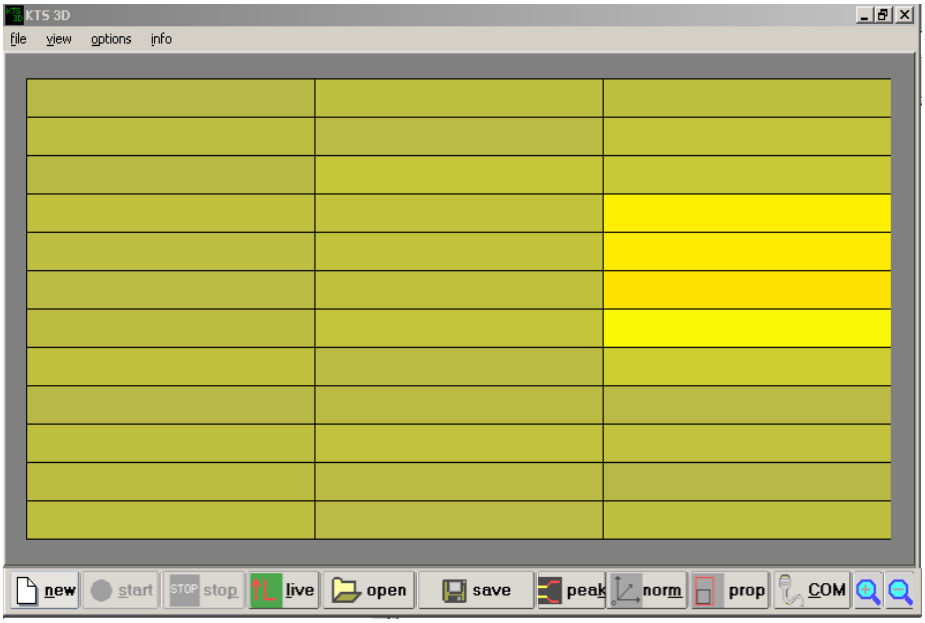
6.1 Adjustment before data recording



Before data acquisition there are various adjustments which must be planned. The track length determines – together with the values per track – the distance (step width) between every individual measurement. The number of values per track is limited to approx. 100. The measurement begins after activating the [Start] button. With the [Cancel] button program termination is possible anytime. Furthermore, one can switch between consensual and contrasensual movement.

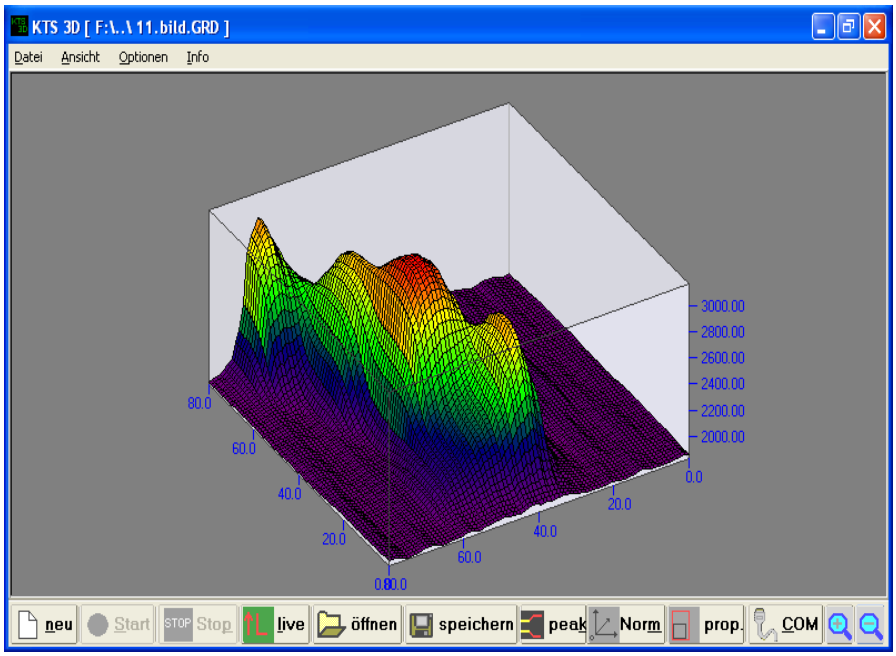
The measurement can be released either manual or time-controlled. A appropriate hint occurs.

6.1.1 Display during data recording



During the actual data recording the ad shows up two-dimensional and in colored nuance. color-like. Of course, the colors are dependent on the chosen adjustment. A storage request appears at the end of the last track; afterwards a switch to the three-dimensional representation takes place.

6.1.2 Display after completion of data recording



The picture shown above appears from the before shown two-dimensional representation.

6.2 Display alternatives

6.2.1 Figures proportional or quadratic

With the button [prop.] the representation switches between proportional and quadratic. In the quadratic representation the ad occurs with quadratic elements. Here details partially are better recognized. The relationship between track length to field width is not taken into account. With the proportional representation the ad proceeds under consideration of the real track length and field width like it was adjusted in [data recording].

> **Note:** The actual measured length / width is only given through the setting [data recording]. An incorrect allocation cannot be recognized by the program.

6.2.2 Figures data absolutely or relatively

Here you can switch between the absolute representation or a relative representation. With the absolute representation the Z-axis is expanded to the full available measuring range. With the relative representation the value area is oriented by the smallest resp. the largest measurement. Thus a maximum detail resolution is reached; this also has affection on the color representation.

6.3 Accumulator and charger

The rating is supplied by an installed 2800 mAh Lithium-Ion-accumulator, which can be loaded with the high-speed battery charger within 3 hours. The actual working time amounts to, depending upon coil size and usage of headphones, approx. 6-12 hours. The loading procedure is indicated by the orange light emitting diode, the green light shows the end of the loading procedure. After each loading procedure the lead for the battery charger should be removed.

In addition, we deliver an inverter module which enables the loading in the car.

7 System requirements and license agreements

7.1 System requirements

The program is a 32-bit-application, which is driven under Windows 98, Windows 2000, Windows NT, Windows XP or Windows 7. As minimum requirements for the adequate use the PC should show the following configuration:

- Processor with pulse frequency from 1000 MHz or more
- Hard disc with approx. 10..20 MByte free storage space
- Graphic card with a minimum resolution of 800 x 600 points
- Bluetooth ability to the connection of the external measuring hardware

7.2 License agreements

The program KTS 3D as well as the entire accompanied electronic or printed documentation is subject to the copyright of KTS-Electronic Co. If parts of the present license regulations should show alterations or expansions opposite the license regulations for former program versions they will come into force from the beginning of the day of entry.

The present license regulations become effective on May 1st, 2007.

Through the utilization of the software the user agrees to the present license regulations. The right of use automatically will cease if the license regulations are ignored.

7.3 Utilization regulations

After full payment of the invoice amount the customer is allowed to a not-exclusive right of usage of the program listed in the bill. This right is restricted to the owner of the original software. Consequently, the software can be used only on one single computer system at the same time. All present and future copyrights and/or industrial protection rights of the provided programs and of all programs derivative from it, program modules or in this context produced records remain at KTS-Electronic.

7.4 Liability exclusions

The present program was tested carefully, nevertheless mistakes are not to be excluded. No guarantee is adopted for the usability of the program to a certain purpose. Especially, no liability is adopted for consequential damages as well as profit and asset losses, that could result from the application of the program as well as the affiliated documentation.

8 Warranty

According to the following conditions (see below) we remedy deficiencies free of charge, if they are evidently based on manufacturing errors or defects and are reported to us immediately after assessment of damage within 24 months after delivery to the ultimate buyer.

Defective parts will be repaired gratuitous or will be replaced by efficient parts of our choice. KTS reserves the right to exchange a device by an equal valued replacement unit in case the returned product cannot be required in an appropriate budget time frame.

On-site repairs cannot be demanded. Replaced, resp. exchanged parts will merge into our property.

The guarantee claim expires in cases of improper handling, gross carelessness or when repairs, modifications, additionally installed parts or extentions are carried out from persons which are not authorized on our part to do so.

Guarantee claims will neither effect an extention of the term nor they will implement a new time limit.

Further requirements, in particular such through extraneous causes resulting damages are excluded, unless a commitment is not necessarily the case.

We therefore are not liable for any accidential, indirect or other subsequent damages of any kind, which lead to limited use, data loss, profit setbacks or operating failures.

8.1 After expiry of warranty

KTS can agree upon a service after expiry of guarantee. In this case repairing and shipment will be charged.

8.2 Legal notice

Before you start searching please note that the monument protection as well as other legal standards are relevant. KTS-ELECTRONIC assumes no responsibility for possible legal violations.

In case of doubts we recommend a comprehensive consultation with an attorney or national monument offices.

9 Contact

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Fridays: 9:00 am to 16:00 pm

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